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How sedimentary processes along glacio fluvial rivers can be applied to determine the origin of the transported sediments

Johan Ploug, Morten Holtegaard Nielsen, and Sandra Bollwerk

Section of Engineering Geology and Arctic Technology, Department of Civil Engineering, Technical University of Denmark (joplo@byg.dtu.dk)

The aim of this study is to look at the mineralogical coupling between glaciated environments, glacio-fluvial rivers and valleys and coastal deltaic areas. Their size and properties i.e. the changes a mineral undertakes during transport from a glacier to the ocean. The study is based on the mapping of sediments along two river systems in the Kangerlussuaq region of West Greenland.

Understanding the processes involving the coupling between glacial erosion, transport and deposition in arctic environments, have the potential to enable us to locate ore deposits of specific sediments along rivers, just by looking at the sediments from the delta.

26 sites were investigated in the Kangerlussuaq area of western Greenland; 16 sites along the two dominating rivers in the area; Sandflugtsdalen River Valley (SRV) and Ørkendalen River Valley (ORV). For each site along the two rivers, water samples were taken in two or three different locations across the river. The results show a cross section of the river instead of a single point reference. Measurements of the water flow were taken using both manual techniques and GPS measurements.

5 sites of the river delta in the Kangerlussuaq fjord were collected as well. Samples spread across the inner part of the delta, attempting to make a convex line. For each of the 5 sites, another five water samples were collected and the water flow, the sediment concentration and the water depth were logged. The samples in the delta were taken every evening over the course of a week in the end of July and in the end of August.

Dry sediment samples were taken at 5 sites along the very end of the river and the inner delta, after the Jökullaup, which elevated the water level of the SRV significantly near the end of July 2010.

This poster presents results from induction-coupled plasma mass spectrometry (ICP-MS) determining the water chemistry. Among elements determined by the ICP-MS are silver (Ag), aluminium (Al), iron (Fe), magnesium (Mg), zinc (Zn) and titanium (Ti). Collected sediments will be determined using microscopical analysis, x-ray diffraction and scanning electron microscopy (XRD and SEM). After the identification is complete, samples will be dissolved and induced to an ICP-MS analysis to determine percentages of trace elements and to reveal quantitative measurements of the elements encountered. This will greatly increase our knowledge of glacio fluvial and glacial marine interactions, with sediments and their origin.